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January 1939

## Test 321: Caterpillar Model R-2 (Distillate)

Tractor Museum

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UNIVERSITY OF NEBRASKA - AGRICULTURAL ENGINEERING DEPARTMENT  
AGRICULTURAL COLLEGE, LINCOLN

## Copy of Report of Official Tractor Test No. 321

Dates of test: July 24 to August 3, 1939.  
Name and model of tractor: CATERPILLAR R-2 (Distillate)  
Manufacturer: Caterpillar Tractor Company, Peoria, Illinois,  
Manufacturer's rating: NOT RATED.

B E L T H O R S E P O W E R T E S T S

H. P.	Crank shaft speed R.P.M.	Fuel Consumption			Water used gal. per hr.	Temp. Deg. F.		Barometer Inches of Mercury
		Gal. per hr.	H. P. hr. per gal.	Lb. per H. P. hr.		Cool- ing med.	Air	
TEST B - 100% MAXIMUM LOAD - TWO HOURS								
28.56	1526	3.684	7.75	0.894	0.000	204	99	28.755
TEST C - OPERATING MAXIMUM LOAD - ONE HOUR								
27.78	1525	3.089	8.99	0.771	0.000	202	93	28.780
*TEST D - ONE HOUR								
26.28	1524	3.000	8.76	0.791	0.000	194	87	28.720
TEST E - VARYING LOAD - TWO HOURS (20 minute runs; last line average)								
26.06	1520	2.974	8.76	0.791	--	194	89	--
1.18	1599	1.636	0.72	9.610	--	175	86	--
13.63	1577	2.338	5.83	1.189	--	178	86	--
26.74	1467	2.866	9.33	0.743	--	190	83	--
6.89	1602	1.978	3.48	1.990	--	173	78	--
20.57	1593	2.766	7.44	0.932	--	175	74	--
15.85	1560	2.426	6.53	1.061	0.000	181	82	28.800

D R A W B A R H O R S E P O W E R T E S T S

H. P.	Draw bar pull pounds	Speed miles per hr.	Crank shaft speed R.P.M.	Slip on drive wheels %	Fuel Consumption			Water used gal. per hr.	Temp. Deg. F.		Baromete Inches o Mercury
					Gal. per hr.	H. P. per gal.	Lb. per H.P. hr.		Cool- ing med.	Air	
TEST F - 100% MAXIMUM LOAD - Second - GEAR											
22.98	3596	2.40	1526	3.53	-----Not Recorded-----				190	95	28.820
TEST G - OPERATING MAXIMUM LOAD											
22.49	5379	1.57	1528	6.89	-----Not Recorded-----				194	85	28.850
22.26	3455	2.42	1526	2.72	-----"-----				198	89	28.920
21.36	2722	2.94	1527	1.36	-----"-----				198	96	28.915
21.31	2258	3.54	1525	0.64	-----"-----				201	100	28.900
19.35	1423	5.10	1527	0.06	-----"-----				200	100	28.900

## \*TEST H - TEN HOURS - Second - GEAR

18.95	2898	2.45	1524	1.19	2.801	6.77	1.024	0.013	192	93	28.910
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\*Formerly called RATED LOAD; see REMARKS 4, page 3.

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FUEL, OIL, AND TIME

Fuel Distillate Octane 38 Weight per gallon 6.93 pounds

Oil: S.A.E. No. 30 To motor 3.037 gal. Drained from motor 3.164 gal.

Total time motor was operated 55 hours

BRIEF SPECIFICATIONS

Advertised speeds, miles per hour: First 1.7 Second 2.5

Third 3.0 Fourth 3.6 Fifth 5.1 Reverse 2.1

Belt pulley: Diam. 12" Face 7 1/2" R.P.M. 850 Belt speed 2670 f.p.m.

Clutch: Make Own Type Dry disc Operated by hand

Seat Upholstered

Total weight as tested (with operator) 6835 pounds

MOTOR: Make Own Serial No. 6J254 SP Type 4 cylinder, vertical

Head I Mounting Crankshaft lengthwise Lubrication Pressure

Bore and stroke 3 3/4" x 5" Rated R.P.M. 1525

Port diameter valves: Inlet 1 5/8" Exhaust 1 7/16"

Magneto: Make Eisemann Model CM-4

Carburetor: Make Zenith Model K-5A Size 1 1/4"

Governor: Make Own Type Variable-speed, centrifugal

Air cleaner: Make Donaldson Type Oil-washed, wire screen filter and  
collector pre-cleaner

Oil Filter: None

Cooling medium temperature control: Fulton thermostat, Pines radiator  
shutter

CHASSIS: Type Tracklayer Serial No. 6J254 SP Drive Enclosed gear

Tread width: 50" Measured length of track 15.3675'

Cleats: Type Integral with shoes No. per track 30

Size 1 7/8" high x 12" long

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REPAIRS AND ADJUSTMENTS

During the drawbar maximum horsepower runs the line from the fuel tank to the fuel pump was broken, apparently due to vibration. A clip, normally used to attach the fuel line to the engine block was inadvertently omitted by the manufacturer. A new line and a clip were installed.

REMARKS

1. All results shown on page 1 of this report were determined from observed data and without allowances, additions, or deductions. Tests B and F were made with carburetor set for 100% maximum belt horsepower and data from these tests were used in determining the horsepower to be developed in tests D and H, respectively. Tests C, D, E, G, and H were made with an operating setting of the carburetor (selected by the manufacturer) of 96.6% of maximum belt horsepower.

	<u>DRAWBAR</u>	<u>BELT</u>
2. Observed maximum horsepower (tests F & B)	22.98	28.56
3. Sea level (calculated) maximum horsepower (based on 60° F. and 29.92" Hg.)	24.66	30.82
4. Seventy-five per cent of calculated maximum drawbar horsepower and eighty-five per cent of calculated maximum belt horsepower (formerly A.S.A.E. and S.A.E. ratings)	18.50	26.20

We, the undersigned certify that the above is a true and correct report of official tractor test No. 321 .

\_\_\_\_\_  
Carlton L. Zink  
Engineer-in-charge

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E. E. Brackett

\_\_\_\_\_  
C. W. Smith

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L. W. Hurlbut  
Board of Tractor Test Engineers